System and Method for Time Based Home Page Selecton

BACKGROUND OF THE INVENTION

1. Technical Field

The present invention relates in general to a system and method for selecting a home, or start, page for a browser application. More particularly, the present invention relates to a system and method for selecting the home page based upon time data and network characteristics.

2. Description of the Related Art

Computer systems in general and International Business Machines (IBM) compatible personal computer systems in particular have attained widespread use for providing computer power to many segments of today's modern society. A personal computer system can usually be defined as a desk top, floor standing, or portable microcomputer that includes a system unit having a system processor and associated volatile and non-volatile memory, a display monitor, a keyboard, one or more diskette drives, a fixed disk storage device and an optional printer. One of the distinguishing characteristics of these systems is the use of a system board to electrically connect these components together. These personal computer systems are information handling systems which are designed primarily to give independent computing power to a single user (or a relatively small group of users in the case of personal computers which serve as computer server systems) and are inexpensively priced for purchase by individuals or small businesses. A personal computer system may also include

one or a plurality of I/O devices (i.e. peripheral devices) which are coupled to the system processor and which perform specialized functions. Examples of I/O devices include modems, sound and video devices or specialized

5   communication devices. Nonvolatile storage devices such as hard disks, CD-ROM drives and magneto-optical drives are also considered to be peripheral devices.

Computers are often linked to one another using a network, such as a local area network (LAN), wide area

10   network (WAN), or other types of networks such as the Internet. By linking computers, one computer can use resources owned by another computer system. These resources can include files stored on nonvolatile storage devices and resources such as printers. An application

15   program called a "browser" is used to view pages of information received from servers on a large computer network, such as the Internet.

Information displayed in the browser is provided by various web sites, or servers, which are often located far

20   from the client computer system. This information provided by the servers generally includes text, graphics, sound, video files and other data. The information is organized into electronic document files called web pages. Web pages may contain hypertext links written in a software language

25   such as the Hypertext Mark-up Language (HTML). Web browsers access these web pages at web sites via a communications protocol known as hypertext transport protocol (HTTP), which is a low-overhead protocol that capitalizes on the fact that navigation documents can be

30   embedded directly. Web browsers are software interfaces

that run on world wide web clients to allow access to web sites via a simple user interface. A web browser allows a web client to request a particular web page by specifying a Uniform Resource Locator (URL). A URL is a web address

5   that identifies the web page and its location on the web. A user navigates through the network by selecting a hyperlink, or label, displayed in the browser, and the browser then loads the corresponding URL and downloads the web page or other associated data from the server.

10   Most browser programs include a "home page" icon that, when selected, directs the user to a predefined home page. While a user might be interested in different types of information throughout the day, changing the home page setting to a different URL is often a manual and somewhat

15   tedious process. As a result, use a single home page throughout each day and on each day of the week. In addition, the user may be interested in work related information when connected to the user's office network and different information when connected to the user's home

20   network. This is especially true when using a portable computing device, such as a laptop computer, at both work and at home.

A challenge to traditional home page implementations is, as described above, that a single home page does not

25   often address the user's primary interest at any given point in time or on any given week. If the user sets his home page to an entertainment web site, then the user must repeatedly change to a work-related web site when at work. Likewise, if the user sets his home page to his company's

web page, he finds himself repeatedly changing to a non-work web site when the user is at home.

What is needed, therefore, is a system and method for changing the user's home page based upon the time of day and day of the week. Furthermore, what is needed is a system and method for changing the user's home page based upon the network (e.g., a home network or a work network) to which the user is connected.

SUMMARY

It has been discovered that the aforementioned challenges are resolved using a system and method that allows a user to select more than one home page where each of the selected home pages are active under different conditions. The conditions that apply include the time of day, the day of the week, and the network to which the user's computing device is connected.

When the user identifies a Web page that he wishes to use as a home page, the system retrieves the address of the Web site (the URL). The system also determines, based upon user input, whether the Web page is desired when the user is using the current network to which the computing device is connected, a different network, or when the user is connected to any network. Then the system gathers the days of the week during which the Web page will be used as a home page as well as the start and end times during which the Web page will be used. The address of the Web page, the network settings, and the day of week / time data are stored in a nonvolatile storage location for subsequent retrieval.

When the user starts the browser application, or when the user selects the "home page" icon requesting the home page, the system retrieves the user's home page selection data in order to determine which Web address should be used as a home page. A default home page can also be stored so that if none of the time based / network based home pages match the current time / network setting, then the default web page is used.

In an alternate embodiment, the user's time and network based home page selections are stored in a redirection web site with the home page in the user's browser set to the redirection web site. When the user opens the browser or requests the home page, a request is sent to the redirection web site that looks up the home page based upon the current time (at the user's system) and the user's current network connection and redirects the user to the time/network based home page. If the user has several computing devices and wishes each of the computing devices to use the same time/network based home pages, then the user simply has the home page address for the browser in each of the devices. Included in the home page request is a user identifier that is used to locate the user's home page selections.

The foregoing is a summary and thus contains, by necessity, simplifications, generalizations, and omissions of detail; consequently, those skilled in the art will appreciate that the summary is illustrative only and is not intended to be in any way limiting. Other aspects, inventive features, and advantages of the present invention, as defined solely by the claims, will become apparent in the non-limiting detailed description set forth below.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention may be better understood, and its numerous objects, features, and advantages made apparent to those skilled in the art by referencing the

5   accompanying drawings.

Figure 1 is a system diagram of a client computing device retrieving and using a time and network connection based home page;

Figure 2 is a flowchart showing the steps taken to

10   gather time and network connection based home page data from the user;

Figure 3 is a flowchart showing steps taken by the home page selector to select a home page based upon the current time and network connection being used by the user;

15   **Figure 4** is a system diagram of a client computing device receiving a home page identifier from a redirection web site that retrieves the user's preferred home page based upon the current time and the network connection being used by the user;

20   **Figure 5** is a flowchart showing steps taken by both the client device and the redirection web site in retrieving the home page identifier for the client and redirecting the client's browser to the identified home page; and

25   **Figure 6** is a block diagram of a computing device capable of implementing the present invention.

DETAILED DESCRIPTION

The following is intended to provide a detailed description of an example of the invention and should not be taken to be limiting of the invention itself. Rather,
5   any number of variations may fall within the scope of the invention, which is defined in the claims following the description.

Figure 1 is a system diagram of a client computing device retrieving and using a time and network connection
10   based home page. Client computing device **100**, such as a personal computer, personal digital assistant (PDA), or other device capable of running a browser to use the Internet, is connected to nonvolatile storage device **125**, such as a hard drive.

15   The user of client computing device **100** makes home page selections (process **105**) which are stored as home page data in nonvolatile storage device **125**. When the user of client computing device **100** is surfing computer network **150** (i.e., the Internet), and identifies a Web page that he
20   would like to use as a home page, process **125** is used to capture the URL of the Web page (either by the user making the home page request from the Web page, or by the user manually entering the name of the Web site, or the Web site's URL, in a data entry area. The user also indicates
25   when the Web page should be used as the user's home page as well as the network connection, such as a home network or a work network, that should be currently active when the Web page is used as a home page. The time-based settings and network connection data are stored in home page data **125**.

When the user, using the browser software, requests a home page (either by initializing the browser or by requesting the home page through a browser interface, such as an icon), home page selector process **130** retrieves the current timestamp (**110**) from the system clock running in computing device **100**. The home pages selector process also retrieves the current network connection (**120**) that identifies the network to which client **100** is currently connected. Home page selector process **130** uses the current time data and the current network connection data to retrieve a Web page identifier (i.e., a URL) from home page data **125**. The browser software running in client computing device **100** then uses the retrieved Web page identifier in making home page request **140** via computer network **150**, such as the Internet.

In the example shown, there are three possible sources of home pages for client computing device **100** based upon the current time data and the current network connection data. These sources include Web Servers **160, 170,** and **175.** Home page request **140** will be directed to one of these Web Servers based upon the time and network connection data. Whichever web server hosts the Web page that is currently selected as the client's home page will receive request **140** and respond by sending Web page data **180** back to the client computing device over network **150.** The client's time based home page (**190**) is then received at client computing device **100** and displayed on the computing device's display screen.

Figure 2 is a flowchart showing the steps taken to gather time and network connection based home page data from the user. The steps shown in **Figure 2** are the

detailed steps performed by the client computing device during process **105** shown in **Figure 1.**

The flowchart in **Figure 2** commences at **200** whereupon, at step **205,** a request to store a home page is received by a user of the computing device. A determination is made as to whether the user is requesting that a currently selected (i.e., displayed) Web page should be used as a home page. If the currently selected page is being requested for use as a home page, decision **210** branches to "yes" branch **212** whereupon, at step **220,** the home page Web address is set to the address of the currently selected Web page. On the other hand, if the user wants a different, non-selected (i.e., non-displayed) Web page to be used as a home page, decision **210** branches to "no" branch **222** whereupon the user enters the home page Web address at step **225.**

A determination is made as to the network setting that is desired before using the selected Web address as the user's home page address (decision **230**). If the user wants the network to which the user's computing device is connected to be the one which is desired when using the selected Web address, then decision **230** branches to branch **235** whereupon, at step **240,** the network setting (identifier) to which the computing device is connected is retrieved. If a different network is to be used other than the one to which the computing device is currently connected, then decision **230** branches to branch **245** whereupon, at step **245,** the user provides the identifier for the network. In one embodiment, a list of networks used by the computing device is displayed to the user and the user selects from the list. If the Web page is to be used as a home page irregardless of the network to which

the computing device is connected, then decision **230** branches to branch **255** whereupon, at step **260**, an flag is set indicating that the Web page is used when "any" network is connected.

5   The user provides the days of the week for which the Web page will be used as a home page (step **270**). For example, for a work-based home page, the user may decide to have the Web page be used as a home page during the week (Monday through Friday), but if the home page is a sports 10   or recreation Web page, the user may decide to use it only on the weekends.

The user provides the starting and ending times that the Web page will be used as a home page (step **275**). Using the example from above, for a work-based home page, the 15   user may decide to have the Web page be used as a home page during working hours, such as 9:00AM to 5:00PM.

At step **280**, the Web address that will be used as a home page along with the network connection criteria and day of the week and time data are stored in home page data 20   store **290**. When the user requests a home page, the data in home page data store **290** will be used to decide which Web page to use as the user's home page depending upon the current network connection, the current day of the week, and the current time of day information. Processing to 25   gather the user's home page selections thereafter ends at **295**.

Figure 3 is a flowchart showing steps taken by the home page selector to select a home page based upon the current time and network connection being used by the user. 30   Processing commences at **300** whereupon, at step **305**, the

current timestamp and day of the week are retrieved from the clock included in the computing device. At step **310**, the network identifier to which the computing device is currently connected is retrieved (i.e., from the Ethernet or other network interface adapter used to connect the computing device to a computer network).

At step **315**, the last (i.e., default) entry in home page table **320** is retrieved. Home page table **320** is one embodiment for storing the home page data showed being stored in home page data **125** in **Figure 1** and **290** in **Figure 2**. In the embodiment of home page table **320** shown in **Figure 3**, home pages that correspond to more specific criteria are saved towards the top of the table and home pages with less specific criteria stored towards the bottom of the table. In the embodiment shown in table **320**, the default, or first selected, home page is at the bottom of the list. As processing continues upward through the list, other the time and network criteria for other home pages are compared with the current time and the current network connection. If another home page matches the time and network criteria, that network is selected until either the end (top) of the list is reached or another home page closer to the top of the list matches the time and network criteria. In this manner, one home page is selected even though more than one home page may match the time and network criteria.

At step **325**, the current best home page match is set to the most recently selected URL from table **310**; in this case the default (bottommost) entry in table **310**. A determination is made as to whether there are more entries to process in table **320** (decision **330**). If there are more

entries to process, decision **330** branches to "yes" branch **332** whereupon, at step **335**, the next entry from the table is selected (i.e., the entry preceding the last selected entry).

5   A determination is made as to whether the newly selected entry has a network connection criteria that matches the device's current network connection (decision **340**). If the network criteria does not match the device's current network connection, decision **340** branches to "no"
10 branch **342** whereupon processing loops back to determine if there are more entries in the table to process. On the other hand, if the network criteria matches the device's current network connection, decision **340** branches to "yes" branch **344** to perform other comparisons.

15   A determination is made as to whether the day of the week criteria for the selected entry matches the current day of the week (decision **345**). If the day of the week criteria does not match the current day of the week, decision **345** branches to "no" branch **346** whereupon
20 processing loops back to determine if there are more entries in the table to process. On the other hand, if the day of the week criteria matches the current day of the week, decision **345** branches to "yes" branch **348** to perform other comparisons.

25   A determination is made as to whether the time of day range criteria for the selected entry matches the current time of day (decision **350**). If the time of day range criteria does not match the time of day, decision **350** branches to "no" branch **352** whereupon processing loops back
30 to determine if there are more entries in the table to

process.   On the other hand, if the time of day range criteria matches the current time of day, decision **350** branches to "yes" branch **354** whereupon the currently selected URL from table **320** is set to be the current home page (step **360**).   Processing then loops back to determine whether there are more entries in table **320** to process and, if there are more entries, these entries are evaluated to determine if they are better home pages, using the user's criteria, than the currently selected home page.

As will be appreciated by those skilled in the art, additional comparisons, such as day of the year, month, etc. can be included as additional criteria in table **320** to further define the home page desired by a user on a particular day, month, etc.   For example, a person that celebrates Christmas could set a shopping site to be the home page when the date is between Thanksgiving and Christmas.

Returning to decision **330**, when all entries in table **320** have been processed the best home page, given the user's criteria will have been selected, and decision **330** branches to "no" branch **362**.   At step **370**, the browser's home page is set to be the last home page that was selected during steps **325** through **360**.   Now, when the user requests the home page, the time and network based home page will be requested.   The processing shown in **Figure 3** is also performed when the browser is initialized so that the initial home page displayed on the browser is a time/network based home page.

At step **375**, processing waits for an event to occur, such as a change in the device's network connection, an

expiration of a time period (if the time/network based home page is refreshed on a particular time interval), another home page request is made by the user, or a shutdown event (shutting down the device), is made. A determination is

5   made as to whether a system shutdown even has occurred (decision **380**). If the event is not a system shutdown, decision **380** branches to "no" branch **385** whereupon processing loops back to select a time/network based home page. This looping continues until a shutdown event

10 occurs, at which point decision **380** branches to "yes" branch **390** and processing ends at **395**.

Figure 4 is a system diagram of a client computing device receiving a home page identifier from a redirection web site that retrieves the user's preferred home page

15 based upon the current time and the network connection being used by the user. This is a network implementation for gathering home page data and criteria (shown in **Figure 2**) and selecting time/network based home pages using the gathered information (shown in **Figure 3**).

20   Each of a user's devices (**400**), such as a personal digital assistant (PDA), desktop PC, and a laptop PC, are each provided the same redirection Web site as the home page in the browser used by each of the devices. When the user opens the browser or requests a home page from any

25 device that has the redirection Web site as the home page, a home page request (**1**) is sent through computer network **450** (such as the Internet), and is received (**2**) at redirection web site **460**. The redirection web site uses home page criteria, such as that shown in table **320** in

30 **Figure 3**, to determine the home page that the user desires given the current time, current day of the week, and

current network connection used at the client device. In this manner, the user maintains the home page preferences at one location (the redirection web site) and simply sets the browser's home page of any device that he wishes to use

5   the time/network based home pages to the redirection web site.

Redirection web site **460** searches a table containing the user's home page preferences (such as table **320** in **Figure** **3**), and responds (**3**) with the URL of the

10   time/network based home page that is desired by the user given the current time of day, day of week, and network connection. The redirection URL travels through network **450** and is received (**4**) by the client device (**400**) that made the request. The browser of the client device is

15   redirected to the new web page by sending a request (**5**) using the received redirection URL.

In the example shown, there are three possible sources of home pages for client computing devices **400** based upon the current time data and the current network connection

20   data. These sources include Web Servers **470, 480,** and **490.** Home page request (**5**) is directed to one of these Web Servers based upon the time and network connection data. Whichever web server hosts the Web page that is currently selected as the client's home page will receive request (**6**)

25   and respond by sending Web page data (**7**) back to the client computing device over network **450.** The client's time/network based home page (**8**) is then received at client computing device **400** and displayed on the computing device's display screen.

Figure 5 is a flowchart showing steps taken by both the client device and the redirection web site in retrieving the home page identifier for the client and redirecting the client's browser to the identified home

5   page.   Client processing commences at **500** whereupon, at step **505,** the current time is retrieved from the clock running in the client device and the current day of the week is computed based upon the date.   At step **510,** the network connection currently connecting the device to a

10   computer network is retrieved.   At step **515,** the address of the default home page is retrieved.   The default home page address is the address of the redirection web site.   The time/network based home page is requested, at step **520,** from the redirection web site.

15   Redirection web site processing commences at **525** whereupon, at step **530,** a request is received from the client computing device.   The request includes a user identifier, identifying the user, a client network identifier, identifying the client device's current network

20   connection, and a timestamp providing data about the time of day and day of week information at the client computing device.   In one embodiment, the request data, such as the user identifier, is stored on the client computing device as a "cookie" and retrieved by the redirection web site

25   using standard cookie processing.

At step **535,** the redirection web site retrieves the home page selections that correspond to the user identifier making the request from client directory **575.**   In one embodiment, client directory **575** and home page tables **570**

30   are combined in one larger database that includes home-page selections for any number of users.   In another embodiment,

client directory **575** is a directory of all active clients of the redirection web site while home page table **570** is a separate table for each of the clients.

A determination is made as to whether the user
5 identifier for the user making the request was found in the client directory (decision **540**). If the user identifier was found, decision **540** branches to "yes" branch **542** whereupon, at step **545**, the redirection web site retrieves (from home page table **570**) the best home page for the user
10 based upon the user's current time and network connection setting (see **Figure 3** for details regarding how the home page is selected). For an example of home page table **570**, see home page table **320** in **Figure 3**. A determination is made as to whether a preferred home page was found for the
15 user given the user's current time and network connection settings (decision **550**). If a preferred home page was found, decision **550** branches to "yes" branch **552** whereupon, at step **555**, the URL for the selected home page is returned to the user's device. On the other hand, if a preferred
20 home page was not found, decision **550** branches to "no" branch **558** whereupon, at step **560**, a default home page is returned to the user's device.

Returning to decision **540**, if the user's identifier was not found in client directory **575**, decision **540**
25 branches to "no" branch **562** whereupon, at step **565**, an error is returned to the client allowing the user to set up time/network based home page settings and this data is stored in home page table **570** and client directory **575**. For a description of the gathering and storing of client
30 home page preferences, see **Figure 2** and corresponding text.

Returning to client processing, the client receives a response from the redirection web site at step **580**. A determination is made as to whether the response is an error (decision **585**) indicating that the user does not have

5   an account at the redirection web site. If the response was not an error (i.e., the response was a redirection URL to a web site to use as a home page), decision **585** branches to "yes" branch **588** whereupon, at step **590,** the client computing device requests the web page corresponding to the

10 URL received from the redirection web site. On the other hand, if the client received an error, decision **585** branches to "yes" branch **592** whereupon, at step **595,** the user sets up an account with the redirection web site and stores time/connection based home page selections on the

15 redirection web site (see **Figure 2** for further details regarding the gathering and storing of home page addresses and criteria). Client processing thereafter ends at **599.**

Figure 6 illustrates information handling system **601** which is a simplified example of a computer system capable

20 of performing the computing operations described herein. Computer system **601** includes processor **600** which is coupled to host bus **602.** A level two (L2) cache memory **604** is also coupled to host bus **602.** Host-to-PCI bridge **606** is coupled to main memory **608,** includes cache memory and main memory

25 control functions, and provides bus control to handle transfers among PCI bus **610,** processor **600,** L2 cache **604,** main memory **608,** and host bus **602.** Main memory **608** is coupled to Host-to-PCI bridge **606** as well as host bus **602.** Devices used solely by host processor(s) **600,** such as LAN

30 card **630,** are coupled to PCI bus **610.** Service Processor Interface and ISA Access Pass-through **612** provides an

interface between PCI bus **610** and PCI bus **614**. In this manner, PCI bus **614** is insulated from PCI bus **610**. Devices, such as flash memory **618,** are coupled to PCI bus **614**. In one implementation, flash memory **618** includes BIOS

5   code that incorporates the necessary processor executable code for a variety of low-level system functions and system boot functions.

PCI bus **614** provides an interface for a variety of devices that are shared by host processor(s) **600** and

10   Service Processor **616** including, for example, flash memory **618**. PCI-to-ISA bridge **635** provides bus control to handle transfers between PCI bus **614** and ISA bus **640,** universal serial bus (USB) functionality **645,** power management functionality **655,** and can include other functional

15   elements not shown, such as a real-time clock (RTC), DMA control, interrupt support, and system management bus support. Nonvolatile RAM **620** is attached to ISA Bus **640**. Service Processor **616** includes JTAG and I2C busses **622** for communication with processor(s) **600** during initialization

20   steps. JTAG/I2C busses **622** are also coupled to L2 cache **604,** Host-to-PCI bridge **606,** and main memory **608** providing a communications path between the processor, the Service Processor, the L2 cache, the Host-to-PCI bridge, and the main memory. Service Processor **616** also has access to

25   system power resources for powering down information handling device **601**.

Peripheral devices and input/output (I/O) devices can be attached to various interfaces (e.g., parallel interface **662,** serial interface **664,** keyboard interface **668,** and

30   mouse interface **670** coupled to ISA bus **640**. Alternatively, many I/O devices can be accommodated by a super I/O controller (not shown) attached to ISA bus **640**.

In order to attach computer system **601** to another computer system to copy files over a network, LAN card **630** is coupled to PCI bus **610**. Similarly, to connect computer system **601** to an ISP to connect to the Internet using a
5   telephone line connection, modem **675** is connected to serial port **664** and PCI-to-ISA Bridge **635**.

While the computer system described in **Figure 6** is capable of executing the processes described herein, this computer system is simply one example of a computer system.
10 Those skilled in the art will appreciate that many other computer system designs are capable of performing the processes described herein.

One of the preferred implementations of the invention is a client application, namely, a set of instructions
15 (program code) in a code module that may, for example, be resident in the random access memory of the computer. Until required by the computer, the set of instructions may be stored in another computer memory, for example, in a hard disk drive, or in a removable memory such as an
20 optical disk (for eventual use in a CD ROM) or floppy disk (for eventual use in a floppy disk drive), or downloaded via the Internet or other computer network. Thus, the present invention may be implemented as a computer program product for use in a computer. In addition, although the
25 various methods described are conveniently implemented in a general purpose computer selectively activated or reconfigured by software, one of ordinary skill in the art would also recognize that such methods may be carried out in hardware, in firmware, or in more specialized apparatus
30 constructed to perform the required method steps.

   While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that, based upon the teachings herein, that changes and modifications may be made without

5 departing from this invention and its broader aspects. Therefore, the appended claims are to encompass within their scope all such changes and modifications as are within the true spirit and scope of this invention. Furthermore, it is to be understood that the invention is

10 solely defined by the appended claims. It will be understood by those with skill in the art that if a specific number of an introduced claim element is intended, such intent will be explicitly recited in the claim, and in the absence of such recitation no such limitation is

15 present. For non-limiting example, as an aid to understanding, the following appended claims contain usage of the introductory phrases "at least one" and "one or more" to introduce claim elements. However, the use of such phrases should not be construed to imply that the

20 introduction of a claim element by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim element to inventions containing only one such element, even when the same claim includes the introductory phrases "one or more" or "at least one" and

25 indefinite articles such as "a" or "an"; the same holds true for the use in the claims of definite articles.